## REMARKS

The present amendment is submitted in an earnest effort to advance the case to issue without delay.

All independent claims have been amended to specify that bleaching occurs not only without use but also without consumption of aldehydes. Support may be found at page 4, line 4.

Claims 1, 2, 4-6, 9-14, 16, 18-20 and 22-24 were rejected under 35 U.S.C. § 102(b) as anticipated by WO 97/38074. Applicants traverse this rejection.

An essential feature of WO '074 is a molecular oxygen activating system. Activation requires certain types of reactive aldehydes whose formulas are provided at page 4 of the reference. Relatively large amounts of the reactive aldehyde are necessary to achieve bleaching.

Anticipation requires all elements of the claimed invention be found in a single prior art reference. Applicants' independent claims all require the absence of any aldehyde that would bleach or be consumed in an atmospheric oxygen bleaching system.

Transition metal catalyst complexes are disclosed by this reference. Most notably, Examples 11-12 at page 17 describe experiments with these catalysts. However, all the experiments are done in the presence of a sizable amount of reactive aldehyde. Applicants' compositions and methods all exclude any aldehyde that would be involved in

a bleaching process or that would be consumed by same. There can be no anticipation in view of this negative limitation in applicants' claims.

Further, the Examiner has stated: "Additionally, even though '074 teaches the use of aldehydes, the instant claims do **not exclude** the use of aldehydes but only state that the complex catalyzes the bleaching of a substrate by atmospheric oxygen without the use of aldehydes. Thus, since '074 teaches the same bleach catalysts as recited by the instant claims, the Examiner asserts that these catalysts would have the same bleaching properties without the use of aldehydes as recited by the instant claims, even though '074 may recognize the fact that aldehydes enhance such a bleaching effect."

Applicants' claims do not exclude the presence of small amounts of aldehydes. These small amounts are ubiquitously found in perfumes and some preservatives. Yet amounts of these types of aldehydes are insignificant for bleach promoting purposes. Applicants' claims **do exclude** those aldehydes in type and amount that would catalyze atmospheric oxygen to bleach the substrate. If any reactive aldehydes were present, their lower activation energy would cause their combination with the oxygen to result in bleach catalysis. Non-aldehyde reactive oxygen could not successfully compete. The present claims literally do exclude reactive aldehydes at levels that would compete with simple atmospheric oxygen bleaching.

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over WO 97/38074. Applicants traverse this rejection.

Some have dreamed about snatching oxygen from the air to use in place of expensive peroxygen compounds. This was a search which few thought would be successful. The closest progress is embodied in two different approaches. One of these is exemplified in WO 97/38074. Oxygen sourced from the air when bubbled through an aqueous solution achieves a bleaching effect on stained fabric. Very low levels of bleaching are achieved, and none could be done without the aldehyde intermediate. Moreover, very significant concentrations of aldehydes are necessary for oxidation to occur.

By contrast, applicants found that reactive aldehydes are unnecessary in the generation of a peroxide intermediate through the reported molecular oxygen activating system. Claims of the present invention specify that bleaching of the substrate occurs with a transition metal complex and atmospheric oxygen but without use or consumption of aldehydes. Anyone skilled in the art considering WO '074 would find the necessity of a reactive consumable aldehyde as essential to any molecular oxygen bleaching system. For these reasons, those skilled in the art would not find the present invention obvious over the reference.

Claims 1, 2, 4-14, 16, 18-20 and 22-24 were rejected under 35 U.S.C. § 103(a) as unpatentable over WO 95/34628 or WO 97/48787. Applicants traverse these rejections.

WO '787 employs bleach catalysts having poly-dentate ligands containing at least 6 heteroatoms. In the Examples, these complexes are combined with hydrogen peroxide to produce bleaching on test cloths. The disclosure describes at length peroxy compounds needed in combination with the iron catalysts. See page 8 (line 14) bridging to page 11 (line 34).

Atmospheric oxygen bleaching is not inherent in this disclosure. An overkill amount of peroxide is used in all the Examples. Atmospheric oxygen is very much more stable than the peroxides and would not compete successfully with the latter.

The reference does mention "molecular oxygen" at page 11 (line 33) and in the Abstract. Those skilled in the art understand the term "molecular oxygen" as not being air that can directly combine with the iron catalysts. Those skilled in the art had exceedingly few templates that would demonstrate bleaching through air. The "molecular oxygen" to those skilled in the art could only be such systems as reported in WO '074. A major limitation of those systems is the requirement for an aldehyde and a free radical initiator. Without the aldehyde/initiator, there is no fixation of oxygen. Further, the system provides very poor performance. Applicants' independent claim specifies that the atmospheric oxygen bleaching occurs without use of aldehydes. "Molecular oxygen" is simply not identical to bleaching directly with air and a transition metal catalyst. Again, it is noted that the present claims explicitly exclude use of aldehydes as bleaching intermediate vehicles.

Anyone skilled in the art considering this reference as a basis for the present invention would have several serious questions. A first question is why the reference uses the phrase "molecular oxygen" instead of the much more common "oxygen", "air" or "atmospheric oxygen". Why does "molecular" adjective "oxygen"? Thus, it is applicants' position that for the present invention, the reference phrase of "molecular oxygen" is non-enabling.

A further reason exists for not equating "molecular oxygen" with "atmospheric oxygen". Were the reference to have meant atmospheric oxygen it would simply have stated that the catalyst would need no peroxide generating system at all. Oxygen or air would always be present in the environment of laundry, dishwashing or hard surface cleaning. Positive recitation of "molecular oxygen" would have to mean something other than atmospheric oxygen or air.

Still there is a further consideration. The reference states that molecular oxygen may be used as the oxidant "as an alternative to the above described peroxide generating systems". This means that the "molecular oxygen" species must be something which is peroxide generating, *and the resulting generated peroxide is the species which the iron complex activates.* Simple atmospheric oxygen is not a peroxide generating system.

Indeed if WO '787 had contemplated that mere atmospheric oxygen would be enough as a co-reactive with the iron complexes, the inventors of that invention would not have relied so heavily upon the complicated peroxy compounds as co-actives. In fact, the inventors in WO '787 would have demonstrated their iron complex (even in a hypothetical example) utilizing air alone. Yet this is not what is found in that reference. WO '787 did not recognize atmospheric oxygen as a co-reactive and any mention of "molecular oxygen" no doubt to the applicants and anyone skilled in the art must have meant much more than merely air.

Another aspect of the claims is that at least 50% of bleaching must be effected by oxygen sourced from the air. Even if the reference phrase "molecular oxygen" were assumed merely to be atmospheric oxygen, there is no suggestion that it would be sufficiently effective to allow as much as at least 50% of any bleaching of the substrate.

According to the Examiner, "the oxygen in the air is the same as molecular oxygen".

Applicants consider the term "molecular oxygen" to be indefinite with respect to rendering the instant claims obvious. Even if "molecular oxygen" is to be given the Examiner's meaning of ground state (triplet) oxygen, there still would remain the issue of how much oxygen is needed to accomplish the oxidant function. Does WO '787 mean 100% gaseous oxygen? Is 50% gaseous oxygen sufficient as an oxidant? Or is 21% oxygen as sourced from the air sufficiently effective? Even if a skilled chemist were to select the most unlikely and most unreactive oxidant, i.e. molecular oxygen, it would still not be obvious that bleaching could be achieved in the diluted medium of air. At the very least the skilled chemist would operate in pure or at least very highly enriched gaseous oxygen environment to achieve bleaching by the catalyst. In short, the reference is non-enabling with respect to the term "molecular oxygen".

Applicants draw attention to the Examples in WO '787 demonstrating the bleaching process. See Examples 3-4. These examples utilize hydrogen peroxide as the oxidant. If "molecular oxygen" were effective why would the patentee employ hydrogen peroxide, a much more expensive material than air? Those skilled in the art could only assume that air was non-operative. The further assumption by those skilled in the art considering this reference would be that an oxidant with greater oxidative power than merely gaseous

oxygen would be necessary to achieve bleaching. Even with the terminology of "molecular oxygen" found in this reference, the skilled chemist would not likely look toward air as an effective source to achieve bleaching with the reported catalysts.

WO '628 under the header "The peroxy bleaching compound" employs 3.5 pages of text to describe all possible variants of such peroxy bleaching compounds. Held to the very end is "As an alternative to the above described peroxide generating systems, molecular oxygen may be used as the oxidant." See page 10 (line 36) bridging to page 11 (line 1).

Those skilled in laundry bleaching art would not interpret "molecular oxygen" as atmospheric oxygen or even air (i.e. 21% oxygen). Here is the logic that any skilled chemist would apply to this situation. WO '628 clearly requires a peroxy compound in conjunction with an oxidation catalyst. These compounds are quite active materials. They include hydrogen peroxide itself, inorganic and organic peroxides and peroxy acids. After a litany of all these relatively expensive reactive peroxides bridging pages 7-10, a caboose refers to "molecular oxygen". Were the latter to simply be interpreted as air, why would the reference deem it even necessary to mention relatively expensive, active peroxides? Indeed, this reference should simply have said an oxidation catalyst is sufficient (with air normally being present in a laundry process). The inevitable answer must be that WO '628 in no way was advocating air as a suitable alternative to peroxy compounds.

So what was meant by "molecular oxygen"? Possibly the answer is found in Example 3. Therein is reported an oxygen saturated phosphate buffer solution containing Methanol Oxidase (MOX) and ethanol for generating hydrogen peroxide. In this peroxide generating

system the MOX enzyme is believed to first convert ethanol via air to acetaldehyde. "Molecular oxygen" is the oxygen source but there is requirement that this must include an enzyme converted aldehyde.

Besides the rationale already provided above, the Examiner should consider the following. The term "molecular oxygen" is a phrase of unusual construction. More likely than not, the phrase was coined not to include air per se. Atmospheric oxygen would tend to be excluded. Systems are the key to understanding the phrase. The cited art in discussing "molecular oxygen" actually means "molecular oxygen systems" which generate peroxides.

Another objection of the Examiner was stated as: "The fact that the catalyst bleaches when exposed to air is a property which is inherent to the particular type of catalyst chosen. Regardless of whether oxygen is from the air or called molecular oxygen which may be sourced from the air or another source, the oxygen is the same."

Applicants independent claims recite a "complex catalysing bleaching of a substrate by atmospheric oxygen". This phrase includes only those catalysts which actually do achieve bleaching simply through atmospheric oxygen. Yet the inherent potential activity of the complex was not previously known and not previously inherently practiced. While some complexes of the present invention may have been described in the literature, they either were not placed in a substrate bleaching situation or when in such situation were in contact with more energetic peroxides than atmospheric oxygen. Those synthetic peroxides would swamp any bleaching from atmospheric oxygen. Thus, any inherent action by atmospheric oxygen was neither appreciated nor inherent in the art.

Independent claims 18 and 25 have the further feature of the transition metal complex attaching itself to the textile or substrate. Upon being dried, the complex nevertheless is still capable of abstracting atmospheric oxygen to continue bleaching in the dried substrate. The references are silent with respect to any "after wash" bleaching in the dry state. These claims should independently be considered as patentable.

Claims 3, 15 and 21 were objected to as being dependent upon a rejected base claim, but otherwise allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for the indication of allowable subject matter but request reconsideration for allowance of all the claims.

In view of the foregoing amendment and comments, the Examiner is requested to withdraw his rejections and pass this case to issue.

Respectfully submitted,

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